

# Bose-einstein condensation of magnons in atomic hydrogen gas

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## Abstract

© 2015 American Physical Society. We report on experimental observation of Bose-Einstein condensation (BEC)-like behavior of quantized electron spin waves (magnons) in a dense gas of spin-polarized atomic hydrogen. The magnons are trapped and controlled with inhomogeneous magnetic fields and described by a Schrödinger-like wave equation, in analogy to the BEC experiments with neutral atoms. We have observed the appearance of a sharp feature in the ESR spectrum displaced from the normal spin wave spectrum. We believe that this observation corresponds to a sudden growth of the ground-state population of the magnons and emergence of their spontaneous coherence for hydrogen gas densities exceeding a critical value, dependent on the trapping potential. We interpret the results as a BEC of nonequilibrium magnons which were formed by applying the rf power.

<http://dx.doi.org/10.1103/PhysRevLett.114.125304>

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